

# **Believability of Hallucinations as a Potential Mediator of Their Frequency and Associated Distress in Psychotic Inpatients**

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**Abstract.** The aim of the current study was to examine how belief in the validity of hallucinations relates to the association between hallucination frequency and associated distress. In a sample of inpatients with psychotic symptoms, results demonstrated that hallucination believability predicted later distress after controlling for symptom frequency. In addition, results were consistent with the hypothesis that hallucination believability mediated the frequency-distress link. Recent randomized controlled trials have supported the efficacy of cognitive behavior therapy for schizophrenia and related psychotic disorders. Further evidence suggests that cognitive behavioral approaches that incorporate mindfulness and acceptance-based strategies may be effective in reducing the believability of positive symptoms. Future trials incorporating longitudinal designs and more detailed assessments of these variables are needed.

*Keywords:* Cognitive behavior therapy, schizophrenia, psychosis, statistical mediation, clinical trial, mindfulness, acceptance, hallucinations.

## **Introduction**

The chronicity and severity typically associated with schizophrenia and other psychotic disorders result in considerable distress and impairment. Randomized controlled trials of cognitive behavior therapy (CBT) for psychosis have reported positive results in comparison to routine care (see Gaudiano, 2005, for a review). Traditionally, assessment and treatment procedures for psychotic patients have focused on evaluations of the frequency and severity of symptoms such as hallucinations. With the renewed interest in adjunctive psychotherapy for psychosis, researchers are beginning to examine a wider array of outcome and process variables in clinical trials. For example, Chadwick and Birchwood (1994) demonstrated that patients' beliefs about auditory hallucinations (e.g. their identity, omnipotence, purpose, control) influenced subjective distress and subsequent behaviors. Furthermore, cognitive interventions decreased the strength of these beliefs about hallucinations and were associated with better outcomes.

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Most recently, clinical researchers have begun to explore the benefits of newer cognitive-behavioral therapies that incorporate acceptance and mindfulness strategies in a variety of clinical populations. Two preliminary trials have demonstrated the efficacy of a mindfulness/acceptance-based intervention called Acceptance and Commitment Therapy (ACT; Hayes, Strosahl and Wilson, 1999) for treating inpatients with psychotic symptoms (Bach and Hayes, 2002; Gaudiano and Herbert, 2006). ACT is based on Relational Frame Theory (RFT), a behaviorally-oriented theory and research program that applies learning principles to the study of language and cognition. The primary assertion of RFT is that verbally-mediated private events (e.g. cognitions, emotions, memories) do not influence behavior directly through their content or frequency, but instead through the context in which they occur. In contrast to the logical disputation of irrational beliefs about hallucinations in traditional CBT, ACT encourages patients to interact with negative thoughts, feelings, and emotions mindfully (i.e. the nonjudgemental present-focused awareness of mental events as different from the self), while simultaneously working toward the pursuit of valued behaviors. In other words, whereas CBT focuses on changing thought *content* directly, ACT attempts to alter the thinking *process* more generally, which is theorized to produce similar results in terms of positive behavioral changes. ACT employs a variety of techniques to accomplish this goal, including meditation and other experiential and exposure-based exercises, didactic metaphors, cognitive “defusion” techniques, and values/goals clarification. However, the ACT therapist refrains from disputing the validity of literal thought content directly and suggests that patients minimize avoidance-based coping, as this can produce paradoxical effects (i.e., increase symptom frequency or intensity).

The aim of the current study was to examine the hypothesis that believability in hallucinations (i.e., the degree of conviction in the validity of hallucinations) mediates the positive relationship found between the frequency of hallucinations and the distress associated with them. The sample was drawn from a randomized controlled trial in which inpatients with psychotic symptoms were assessed prior to and again following either enhanced treatment as usual (ETAU) or ETAU plus ACT during their hospitalization.

## Method

Refer to Gaudiano and Herbert (2006) for a full description of the sample and procedures. Participants were 40 currently hospitalized patients from whom informed consent was obtained. All participants met DSM-IV criteria for a primary psychotic disorder or mood disorder with psychotic features based on psychiatric interviews conducted by the treating physician at admission. Average age of patients was 40 ( $SD = 10$ ). The sample was predominantly male (64%), African-American (88%), unemployed (86%), and single (88%). Average length of stay on the unit was 11 days. As part of the larger clinical trial, patients were randomized to ETAU ( $n = 21$ ) or ETAU plus individual sessions of ACT ( $n = 19$ ). Patients received a brief ACT intervention with the number of individual treatment sessions corresponding to their length of stay ( $R = 1-5$ ;  $M = 3$ ). ETAU consisted of milieu treatment on the unit plus increased symptom monitoring and therapist contact. In ACT sessions, participants were encouraged to increase their acceptance of the *experience* (not the literal content) of psychotic symptoms, while practicing valued behavioral goals, based on a treatment manual developed by Bach and Hayes (2002). Patients also were encouraged to minimize

coping strategies aimed at avoiding or disputing hallucination-related content directly and to notice the transient nature of symptoms.

Participants were asked to rate separately the frequency, believability, and distress associated with their hallucinations using a Likert-scale format (adapted from Bach and Hayes, 2002). Regarding frequency of hallucinations, participants were asked: "On average, how often have you heard voices in the month prior to admission?" 1 = never; 2 = less than once a week; 3 = about once a week; 4 = several times a week; 5 = daily; 6 = more than once a day; 7 = almost constant. Regarding believability of hallucinations, participants were asked: "On a scale from 0 to 10, how much do you believe that (specific hallucination) is real or true? Zero means that you are certain it is not real or true, and 10 means you are absolutely certain that it is real or true". In the current study, believability was conceptualized as a rating of the validity of hallucinations in general, in contrast to specific beliefs about the nature of hallucinations (e.g. the "identity" or perceived omnipotence of the voice). For example, one patient experienced an auditory hallucination in which his deceased father would call him an "evil" person. In this case, the question would be: "On a scale from 0 to 10, how much do you believe that the voice of your father telling you that you are an evil person is real or true?" Regarding distress associated with hallucinations, participants were asked: "On a scale from 0 to 10, how bothered are you by (specific hallucination)? Zero means not distressed at all and 10 means the most distressed you've ever been." Ratings were taken shortly after admission to the hospital and then again prior to discharge.

## Results

See Gaudio and Herbert (2006) for a description of results from the clinical trial. Twenty-nine participants had complete assessment data at pre- and post-treatment. Only one participant from each group actually withdrew from the study. Rates of missing post-treatment data due to unexpected discharge from the hospital did not differ between groups (ETAU  $n = 5$ ; ETAU + ACT  $n = 4$ ). An analysis was conducted to determine if believability of hallucinations predicted associated distress beyond the variance accounted for by the frequency of hallucinations (see Table 1). Pearson  $r$  correlations between variables were all significant, positive, and moderate in magnitude (all  $ps < .05$ ). A hierarchical multiple regression analysis was conducted entering relevant demographic variables (gender, age, and psychotic vs. mood disorder) first, pre-test hallucination frequency second ( $M = 4.9$ ,  $SD = 2.3$ ), and pre-test hallucination believability third ( $M = 7.0$ ,  $SD = 3.3$ ) to predict post-test hallucination-related distress ( $M = 6.7$ ,  $SD = 3.2$ ). Hallucination frequency significantly predicted distress prior to the inclusion of the believability rating ( $p = .01$ ), such that higher hallucination frequency at pre-test predicted higher distress at post-test. However, in the final model, only diagnostic status ( $p < .05$ ) and hallucination believability ( $p < .01$ ), but not frequency ( $p = .57$ ), significantly predicted distress. Specifically, a diagnosis of a primary psychotic disorder (versus mood disorder with psychotic features) and higher hallucination believability at pre-test predicted higher distress at post-test.

An analysis was conducted to examine whether believability in hallucinations was acting as a mediator in the relationship between frequency of hallucinations and associated distress. Based on recommendations by Baron and Kenny (1986), three independent regression equations were computed: regressing the mediator (i.e. believability) on the independent variable (i.e. frequency); regressing the dependent variable (i.e. distress) on the independent variable; and

**Table 1.** Hierarchical multiple regression analysis using pre-test variables to predict post-test distress associated with hallucinations

Predictors	Coefficients			
	Standardized	Unstandardized	<i>t</i>	<i>p</i>
Equation #1				
Gender	-.19	-1.21	-.99	.33
Age	.20	.06	1.07	.30
Diagnosis	-.13	-.83	-.67	.51
Equation #2				
Gender	-.24	-1.48	-1.38	.18
Age	.19	.06	1.17	.25
Diagnosis	-.20	-1.24	-1.14	.27
Hallucination frequency	.49	.74	2.93	*.01
Equation #3				
Gender	-.25	-1.55	-1.74	.10
Age	.16	.05	1.14	.27
Diagnosis	-.33	-2.07	-2.21	*.04
Hallucination frequency	.10	.16	.58	.57
Hallucination believability	.64	.65	3.46	*.00

Note: \* = significant result. Equation #3:  $F_{5, 23} = 5.97, p < .01, R^2 = 0.57$ .

regressing the dependent variable on both the independent and mediator variables. Mediation occurs if the first two regressions are significant, and in the third equation, the strength of the relationship between the independent and dependent variables is decreased by the inclusion of the mediator. The following self-report measures were used in the analyses: hallucination frequency over the past month (retrospectively assessed at pre-test), current distress associated with these hallucinations (assessed at pre-test), and post-test distress associated with these hallucinations.

All the above conditions were met. Frequency of hallucinations over the past month significantly predicted pre-test believability of hallucinations ( $\beta = .69, t = 5.96, p < .01$ ). Frequency also predicted post-test distress about hallucinations ( $\beta = .44, t = 2.55, p < .05$ ). Finally, believability ( $\beta = .52, t = 2.56, p < .05$ ) but not frequency of hallucinations ( $p = .61$ ) predicted associated distress ( $F_{2, 26} = 7.19, p < .01$ ). Testing the standard error of the indirect effect using the Sobel test indicated that believability mediated the relationship between frequency of hallucinations and associated distress ( $t = 2.35, p = .05$ ). These results are consistent with the hypothesis that the frequency of hallucinations is associated with distress based on the strength of believability in them.

A similar mediation analysis was conducted to test whether hallucination frequency was a potential mediator of believability and distress. These conditions were not met; pre-test hallucination believability did not predict pre-test frequency ( $p = .35$ ), and pre-test hallucination frequency ( $p = .61$ ) was not a significant predictor of post-test distress in the context of hallucination believability.

## **Discussion**

As expected, pre-test hallucination frequency predicted later distress associated with hallucinations. However, results revealed that hallucination believability predicted unique variance beyond that accounted for by symptom frequency alone and the other covariates. Furthermore, results were consistent with the hypothesis that the believability of hallucinations at least partially mediated the positive association between symptom frequency and related distress. Results suggest the importance of targeting not only the frequency of psychotic symptoms in treatment, but also, and perhaps even especially, the patient's relationship to them. Psychotherapies for psychosis, such as traditional CBT and newer CBT approaches that emphasize acceptance and mindfulness, may be particularly helpful in targeting not only symptom frequency, but other related psychological mediators of distress, such as beliefs about symptoms (see Chadwick and Birchwood, 1994).

Even though results in the present study were consistent with the hypothesis that believability mediated the relationship between symptom frequency and distress, conclusions are tempered by study limitations. It is important to note that ratings were face valid and could have been subject to demand characteristics. In addition, participants were asked to report hallucination frequency in the past month retrospectively in the current study. In order to test mediation fully, the temporal relationship between variables must be clearly demonstrated. Furthermore, because participants were receiving different treatments between assessment points, it is unclear whether results pertain to ACT specifically, patients receiving treatment in general, or patients with psychotic symptoms more broadly. An attempt was made to conduct mediation analyses separately by treatment group, but neither set of analyses reached statistical significance for all conditions, probably due to low power. Finally, self-report ratings in the current study assessed believability in a general sense, and it is unclear how this related to more specific beliefs about hallucinations (e.g. their perceived identity or purpose).

Other sources of data may be helpful to consider in the context of the current findings. Bach and Hayes (2002) reported that ACT produced greater reductions in self-reported believability in psychotic symptoms relative to treatment as usual in psychotic inpatients. In a replication study by Gaudio and Herbert (2005), only the ACT group showed significant improvements in hallucination believability over time. Furthermore, decreases in hallucination believability, but not frequency, predicted decreases in distress over the course of treatment in the ACT but not ETAU only condition. Teasdale and colleagues (2002) demonstrated that increased metacognitive awareness (i.e. the degree to which individuals experience negative thoughts/feelings as mental events rather than as the self) predicted relapse in recovered depressed patients treated with either mindfulness-based or traditional cognitive therapy (Teasdale et al., 2002). Such evidence suggests that results from the current study may be most applicable to patients in treatment.

Future outcome trials should continue to examine and target symptom believability, frequency, and distress in persons with psychosis using longitudinal designs and a broader range of psychometrically-sound instruments to identify other potential psychological mediators. For example, one potentially useful scale for this purpose would be the Psychotic Symptom Rating Scales (PSYRATS; Haddock, McCarron, Tarrier and Faragher, 1999), which assess various dimensions of psychotic symptoms (e.g. beliefs about the origins of voices).

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